REMARKS

Claims 1-13 and 15-26 are in this application and are presented for consideration. By this Amendment, Applicant has amended claim 1.

Applicant has also attached replacement sheet of drawings of Figures 1, 8 and 9. Figure 1 has been amended show the device 100. Figures 8 and 9 have been revised the guide elements 80. Applicant respectfully requests that the Examiner enter the drawings as now presented.

Claims 1-8 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (JP 2001-291759) in view of Kato et al. (U.S. 5,752,609).

Applicant has amended claim 1 to provide a control unit that controls the moving means to move a tool to separate one wafer from a stack of wafers. The control unit controls the movement of the moving means such that the tool has a first contact surface in contact with a storage element adjacent to the selected storage element to be removed and a second contact surface of the tool is in contact with the selected storage element. The control unit moves the moving means so that the tool is moved such that the selected storage element is at a spaced location from an upper stack of storage elements and a lower stack of storage elements. This advantageously provides a highly space efficient device that stores a very large amount of substrates that can simply remove specific individual wafers from the storage device without having to individually remove the wafers above or below it. The prior art as a whole fails to teach or suggest such a device having such space efficiency advantages.

Abe et al. discloses an array-pitch inverter. The inverter has an accumulated tray 1 for conveyance that is laid on a base plate 7. A nail plate 2 which supports each tray 1 for conveyance is formed in each accumulated tray 1 for conveyance. Each nail plate 2a, 2b is mutually connected by bond part material 3. Nail plate 2a of the maximum upper case is fixed to the support frame 9. Nail plate 2d is connected with the base plate 7 by the bond part material 3. The support frame 9 is attached in a migration device 5. A control system is connected to the migration device 5. The migration device 5 is operated via a control system such that the support frame 9 rises. With a rise of the support frame 9, nail plate 2a rises. The upper flange 33a of bond part material 3a is supported by nail plate 2a and nail plate 2b is supported by flange 33b of the lower part of the bond part material 3 so that nail plate 2b rises when nail plate 2a rises. In a preferred embodiment, the array-pitch inverter is equipped with a compression coil spring 6 composed of a shock absorbing material. The spring 6 is located between nail plate 2a and nail plate 2b.

Abe et al. fails to teach and fails to suggest the combination of a control unit that moves a tool such that the tool engages one wafer in a stack of wafers and moves the stack to separate one wafer from the entire stack. At most, Abe et al. discloses a compression coil spring, which acts as a shock absorbing material between nail plate 2a and nail plate 2b. However, the compression coil spring 6 of Abe et al. is moved via a moving means with the use of a control unit to separate the nail plates 2a and 2b as claimed. Applicant fails to see how the compression coil spring 6 of Abe et al. is even remotely equivalent to the tool of the present invention. At no point does Abe et al. disclose a control unit that controls a moving

means so that the coil spring 6 is moved such that the coil spring 6 separates one of the nail plates 2a and 2b from an upper stack of storage elements and a lower stack of storage elements. As such, the prior art as a whole takes a different approach and fails to disclose each feature of the claimed combination.

Abe et al. also fails to teach or suggest the combination of a control unit that controls a moving means to move a tool such that the tool separates a storage element from an upper stack of storage elements and a lower stack of storage elements as recited in claim 1. At most, Abe et al. discloses an array-pitch inverter that has nail plates 2a and 2b connected to one another such that when the migration device 5 is actuated the nail plates 2a and 2b move together. However, the array-pitch inverter of Abe et al. fails to select a storage element to be removed and fails to move the migration device 5 such that the compression spring 6 separates one of the nail plates 2a and 2b from an upper stack of storage elements and a lower stack of storage elements as claimed. In contrast to the present invention, the nail plates 2a and 2b collectively move together when the migration device 5 is actuated. Compared with Abe et al., the present invention provides a device for selecting one storage element that is to be removed from a plurality of stacked storage elements. The tool of the present invention is moved with a moving means, which is controlled by a control element, such that the stacked storage elements are divided and moved so that the selected storage element can be removed. This advantageously allows a simple and easy way to remove one storage element from a plurality of closely stacked storage elements by increasing the distance between the selected storage element to be

removed from an upper stack of elements and a lower stack of elements. Abe et al. fails to disclose such advantages since Abe et al. only teaches moving a stack of interconnected storage elements such that the storage elements are moved in groups. However, Abe et al. does not disclose a control unit that controls a moving means to move a tool as claimed. As such, the prior art as a whole fails to direct the person of ordinary skill in the art toward each feature of the present invention as recited in claim 1.

Kato et al. discloses a wafer boat 60 that is transferred into a longitudinal heat treatment furnace 40. The wafer boat 60 is made of a heat resistive material. The wafer boat 60 has six rods 61a to 61f. Each rod has its upper and lower ends held by disklike holding plates 62a and 62b. The rods 61a to 61f are arranged parallel to each other. The rods 61a to 61f are arranged at regular intervals on half a circumferential portion of each of the holding plates 62a and 62b. A wafer W is transferred over the other half circumferential portion on which no rods are arranged. A plurality of ring members 63 are provided on the rods 61a to 61f in the longitudinal direction with a predetermined distance L1 interposed between each pair of adjacent rods. The outer diameter of the ring member 63 is set larger than the diameter of the wafer W.

Kato et al. fails to teach or suggest the combination of a control unit that controls a moving means such that a tool separates a selected storage element from an upper stack of storage elements and a lower stack of storage elements. Kato et al. merely discloses a wafer boat 60 that is transferred into a longitudinal heat treatment furnace 40. However, Kato et al. is completely void of any teaching or suggestion for a control unit that moves a moving

means so that the tool separates one storage element from a stack of storage elements. In fact, the references as a whole fail to provide any suggestion for using the teachings of Kato et al. to modify the pitch inverter of Abe et al. The person of ordinary skill in the art would not look to the teachings of Kato et al. to modify the device of Abe et al. As such, the references as a whole fail to provide any teaching or suggestion for the combination of features as claimed in claim 1. Accordingly, Applicant respectfully requests that the Examiner favorably consider claim 1 and all claims that depend thereon.

Claims 9-11 and 22 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. in view of Kato et al. and further in view of Tanaka et al. (U.S. 2002/0002946). Although Tanaka et al. teaches a processing apparatus for processing a sample, the references as a whole fail to suggest the combination of features claimed. Specifically, Abe et al. and Kato et al. do not suggest or teach the combination of a control unit that controls a means for moving a tool such that the tool divides a stack of storage elements so that a selected storage element can be removed. The references as a whole provide no suggestion of using the teachings of Tanaka et al. to modify either the array-pitch transfer apparatus of Abe et al. or the wafer boat of Kato et al. The references together do not suggest the combination of features claimed. One of ordinary skill in the art is presented with various concepts, but these concepts do not provide any direction as to combining the features claimed. All claims define over the prior art as a whole.

Claims 15-17 and 20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. in view of Kato et al. and further in view of Cerf (U.S.

4,909,412).

As previously discussed above, Abe et al. and Kato et al. fail to provide any teaching or suggestion for a tool that is moved via a moving means, which is controlled by a control unit, to separate a selected storage element from an upper stack of storage elements and a lower stack of storage elements. Cerf also fails to teach or suggest the combination of a moving means that is controlled by a control unit to move a tool with a first storage element contact surface of the tool engaged with a first storage element and with a second storage element contact surface engaged with a second storage element such that the second storage element is located at a spaced location from an upper stack of storage elements and a lower stack of storage elements. Cerf merely discloses two moving blade members 36A and 36B wherein each blade is moved via a respective air cylinder 1, 3 such that the blades are moved horizontally and vertically in a sequence to dislodge one tray from a lowermost end of a stack during each cycle of operation. However, Cerf does not teach or suggest a control unit that is programmed to control a moving means to move one of the blades with a blade contact surface in contact with one tray and another blade contact surface in contact with another tray to remove a selected tray from an upper and lower stack of trays as claimed. As such, the references together do not suggest the combination of features claimed. All claims define over the prior art as a whole.

Claim 21 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. in view of Kato et al. and further in view of Matsuyama et al. (U.S. 2002/0125170). Although Matsuyama et al. teaches a front-opening wafer transport module having a

container portion with transparent shell and a central support structure which includes a machine interface exposed at the bottom of the module and integral wafer support columns extending upwardly in the container portion for supporting wafers, the references as a whole fail to suggest the combination of features claimed. Specifically, Abe et al. and Matsuyama et al. do not suggest or teach the combination of a control unit that controls a means for moving a tool such that the tool divides a stack of storage elements so that a selected storage element can be removed. The references as a whole provide no suggestion of using the teachings of Matsuyama et al. to modify the array-pitch transfer apparatus of Abe et al. The references together do not suggest the combination of features claimed. One of ordinary skill in the art is presented with various concepts, but these concepts do not provide any direction as to combining the features claimed. All claims define over the prior art as a whole.

Claim 23 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. in view of Kato et al. and Tanaka et al. and further in view of Matsuyama et al. (U.S. 6,238,283).

The references as a whole fail to disclose a control unit that controls a moving means that moves a tool to separate a selected storage element from an upper stack of storage elements and a lower stack of storage elements. At most, Abe et al. discloses a coil compression spring composed of a shock absorbing material that is located between nail plates 2a and 2b. However, the coil compression spring 6 of Abe et al. is not moved such that the spring 6 separates one storage element from a stack of storage elements. Abe et al.

alone or in combination with the teachings of Kato et al., Tanaka et al. and Matsuyama et al. fails to direct the person of ordinary skill in the art toward each feature of the claimed combination. Accordingly, all claims define over the prior art as a whole.

Claims 1-8, 12, 13, 15-17 and 20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. in view of Kato et al., Schneider (U.S. 4,055,258) and Cerf.

As previously discussed above, Abe et al. and Kato et al. fail to disclose a control unit that controls a moving means that moves a tool such that the tool separates a selected storage element from an upper stack of storage elements and a lower stack of storage elements. The Office Action takes the position that Schneider and Cerf disclose a tool that is moved via a moving means as claimed.

Schneider discloses a sheet material de-stacking machine comprising a gripping device consisting of an upper jaw 21 and a lower jaw 22 for removing a partial stack from a stack of sheet material 4.

Cerf discloses a machine for separating trays. Figure 13 shows the blades A and B in their initial (or final) position. Two blades A and B are movably mounted about the periphery of the tray members 14. Blade A is displaced downwardly from its position in Figure 13 a short distance just greater than the thickness of a flange while simultaneously blade B moves downwardly a much greater distance as shown in Figure 6. The downward motion overcomes the frictional engagement between the nested trays and the lowermost tray 14 is dislodged so that it falls to the tray support surface 12 directly below. The

penultimate tray in Figures 4 and 6 now becomes the lowermost tray and is supported at its flanges by blade A as shown in Figure 6. In step two, blade B retracts as shown in Figure 7 while blade A remains in its slightly lowered position. At the completion of step three, shown in Figure 8, retracted blade B moves upwardly as indicated by arrow 76. The length of its upward stroke is equal to the length of its downward stroke since the entire stack of trays have dropped downwardly when blade A dropped. In Figure 10, extended blade A is underlying the flange of the lowermost tray in the nested stacks as shown in Figures 6-9; blade B has extended from its Figure 9 position and is disposed in overlying relation to the lowermost flange in underlying relation to the flange of the penultimate tray in the stack. Figure 11 depicts the respective positions of blade members A, B at the completion of the fifth step. Blade A has retracted and blade B has not moved from its Figure 10 position; the lowermost tray is suspended above tray support surface 12 by its frictional engagement with the penultimate tray. Blade B again remains unmoved from its Figure 10 position at the completion of the sixth step, as shown in Figure 12. Retracted blade A has moved upwardly, as indicated by arrow 70, into coplanar relation to blade B. At the completion of the seventh step, blade B is again extended and the initial position of Figure 13 is achieved.

Schneider and Cerf fail to teach or suggest the combination of a control unit controlling the movement of a moving means so that a tool with a first storage element contact surface of the tool engages a first storage element and a second storage element contact surface of the tool engages a second storage element such that the second storage element is located at a spaced location from an upper stack of storage elements and a lower

stack of storage elements. Cerf discloses that blades A and B contact the same tray in an initial position as shown in Figure 13. Blade B is then moved downward to remove the tray while blade A maintains the stack of trays from falling. Blade B of Cerf is then moved to the tray above the tray that is in contact with blade A so that blade A can then move into the same position as blade B. This is a completely different approach than the movement of the tool via the moving means controlled by a control unit of the present invention since Cerf clearly teaches moving two different tools (36A and 36B) with two different moving means (air cylinder 1 and air cylinder 3). Compared with Cerf, the tool of the present invention is moved with the first storage element contact surface of the tool engaged with a first storage element and with a second storage element contact surface of the tool engaged with a second storage element. The tool of the present invention moves when the contact surfaces of the tool are in contact with two different storage elements. This advantageously provides quick and easy removal of a selected storage element from a large amount of storage elements. Cerf fails to disclose such advantages since Cerf requires two blades A and B wherein one blade is moved via one air cylinder 1 to hold the stack of trays while the other blade is moved via another air cylinder 3 to remove one of the trays and is then moved to the next tray to be moved. However, the blades A and B of Cerf do not move two trays together as claimed. Cerf merely discloses that one blade removes one tray from a stack of trays while the other blade keeps the stack from falling. This disadvantageously requires two different tools that are moved by two different air cylinders. As such, the prior art as a whole takes a very different approach and fails to direct the person of ordinary skill in the

art toward the movement of the tool as claimed. Accordingly, Applicant respectfully requests that the Examiner favorably consider claim 1 as now presented and all claims that depend thereon.

Claims 9-11 and 22 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. in view of Kato et al., Schneider and Cerf and further in view of Tanaka et al. Although Tanaka et al. teaches a processing apparatus for processing a sample, the references as a whole fail to suggest the combination of features claimed. Specifically, the references as a whole do not suggest or teach the combination of a control unit that controls a means for moving a tool such a first storage element contact surface of the tool is engaged with a first storage element and a second storage element contact surface of the tool is engaged with a second storage element to remove the second storage element from an upper stack of storage elements and a lower stack of storage elements. The references as a whole provide no suggestion of using the teachings of Tanaka et al. to modify either the array-pitch transfer apparatus of Abe et al. or the wafer boat of Kato et al. The references together do not suggest the combination of features claimed. One of ordinary skill in the art is presented with various concepts, but these concepts do not provide any direction as to combining the features claimed. All claims define over the prior art as a whole.

Claims 18, 24 and 25 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Harris et al. (U.S. 2002/0179863) in view of Nyseth et al. (U.S. 2002/0125170) and Matsuyama et al. (U.S. 6,238,283).

Harris et al. discloses an apparatus 100 including a workpiece loader 120 having two

container supports 130, each housed in a protective shroud 131 and configured to position a workpiece container 140 relative to a housing 110. The container 140 can be configured to house a stack of vertically spaced apart microelectronic workpieces 101, each supported in a horizontal position on at least one support member 142.

Nyseth et al. discloses a composite transport module 20 for wafers comprised of a container portion 22 and a door 24. The container portion 22 is comprised of a shell 58 and a central support structure 60. The central support structure 60 is comprised of a bottom portion with an equipment interface 86 configured as a plate with three interface structures 88 which comprise a kinematic coupling. Integral with the machine interface portion 86 are a pair of wafer support columns 92 each of which comprise a plurality of shelves 94 and defining a wafer receiving region 95. Each shelf having wafer engagement portions 96. The wafer support columns 92 are integral with a top portion 100 which includes a spanning member 101 which extends between the tops 98 of the support columns 92 and also includes a first connecting member 104.

Matsuyama et al. discloses a container 54 comprising a base portion 54a and a cover portion 54b mounted on the base portion 54a. A cassette 52 carrying the works 56 is contained in the container 54. The container 54 containing the cassette 52 is placed on the support portion 26 of the trolley 12. A locking device 28 is provided for locking the cover portion 54b to the base portion 54a.

The references as a whole fail to disclose a transport storage container structure formed from a plurality of storage elements stacked consecutively one on top wherein a

locking means is applied to the transport storage container structure to maintain a clean room environment within the structure. Harris et al., Nyseth et al. and Matsuyama et al. disclose containers that house wafers. However, the wafers do not form the transport storage container structure. Harris et al. merely discloses a container 140 that houses a stack of vertically spaced apart microelectronic workpieces 101, each supported in a horizontal position on at least one support member 142. However, the support members 142 of Harris et al. do not form the container 140 as claimed. Similar to Harris et al., Nyseth et al. discloses a composite transport module 20 that houses a plurality of shelves 94, but the shelves 94 do not form the transport module 20. Matsuyama et al. discloses a container 54 containing cassettes 52, but the cassettes 52 do not form the container 54 as claimed. Compared with the references as a whole, the storage elements of the present invention form a transport container structure that is sealed by a locking means. This is significant in the present invention because it prevents the substrates from becoming contaminated and prevents dust and other contaminants from entering the container. Each reference fails to teach or suggest such an advantage since each reference discloses a structure that covers the storage elements, but the storage elements do not form a transport container structure as claimed. As such, the prior art as a whole takes a different approach and fails to direct the person of ordinary skill in the art toward each feature of the claimed combination. Accordingly, Applicant respectfully requests that the Examiner favorably consider claim 18 as now presented and all claims that depend thereon.

Claim 21 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Abe

et al. in view of Kato et al., Schneider and Serf and further in view of Matsuyama et al.

Although Matsuyama et al. teaches a front-opening wafer transport module having a container portion with transparent shell and a central support structure which includes a machine interface exposed at the bottom of the module and integral wafer support columns extending upwardly in the container portion for supporting wafers, the references as a whole fail to suggest the combination of features claimed. Specifically, Abe et al. and Matsuyama et al. do not suggest or teach the combination of a control unit that controls a means for moving a tool such that the tool divides a stack of storage elements so that a selected storage element can be removed. The references as a whole provide no suggestion of using the teachings of Matsuyama et al. to modify the array-pitch transfer apparatus of Abe et al. The references together do not suggest the combination of features claimed. One of ordinary skill in the art is presented with various concepts, but these concepts do not provide any direction as to combining the features claimed. All claims define over the prior art as a whole.

Claim 23 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. in view of Kato et al., Schneider, Cerf and Tanaka et al. and further in view of Matsuyama et al. (U.S. 6,238,283).

The references as a whole fail to disclose a control unit that controls a moving means that moves a tool to separate a selected storage element from an upper stack of storage elements and a lower stack of storage elements. At most, Abe et al. discloses a coil compression spring composed of a shock absorbing material that is located between nail

plates 2a and 2b. However, the coil compression spring 6 of Abe et al. is not moved such that the spring 6 separates one storage element from a stack of storage elements. Abe et al. alone or in combination with the teachings of Kato et al., Tanaka et al. and Matsuyama et al. fails to direct the person of ordinary skill in the art toward each feature of the claimed combination. Accordingly, all claims define over the prior art as a whole.

Favorable action on the merits is requested.

Respectfully submitted
for Applicant,

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Attached: (2) Sheets of Replacement Drawings
Petition for Three Month Extension of Time

JJM:BMD
72099-17

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SHOULD ANY OTHER FEE BE REQUIRED, THE PATENT AND TRADEMARK OFFICE IS HEREBY REQUESTED TO CHARGE SUCH FEE TO OUR DEPOSIT ACCOUNT 13-0410.